deviation of the compass on ship-board by an iron plate; for should circumstances require the removal and replacement of the compensating plate in high northern latitudes, its magnetism might be so altered by the effect of rotation as materially to injure its compensating property. The means of avoiding this disagreeable consequence are pointed out.

Observations to determine the Amount of Atmospherical Refraction at Port Bowen in the Years 1824-25. *By Captain* W. E. Parry, *R.N. F.R.S.; Lieutenant* Henry Foster, *R.N. F.R.S.; and Lieutenant* J. C. Ross, *R.N. F.L.S.* Read June 15, 1826. [*Phil. Trans.* 1826, Part IV. *p.* 206.]

The author commences by observing, that on attempting the various methods proposed by astronomers for ascertaining by actual observation the amount of atmospherical refraction at low altitudes, they all proved impracticable at Port Bowen, by reason of the intense cold, which rendered it impossible to use the repeating circle or other similar instruments. The method therefore proposed by Lieutenant Foster, and modified by Captain Parry, which was found successful, was, to place a board edgeways and truly horizontal on that part of the high land behind which a given star set, and observe the moments of its disappearance. Then, determining at leisure the zenith distance of the upper edge of the board on the return of the sun, and in weather better fitted for delicate observations, the stars fixed on were α Aquilæ and Arcturus; and the paper before us gives a detailed account of a series of observations of the moments of disappearance of both these stars, and also of the zenith distances of the boards employed by the several observers enumerated in the title. In some cases also, the reappearance of the star below the board was observed, thus giving an observation at another altitude, and the angular breadth of the board was afterwards measured by a micrometer from the station of observation.

Description of a Percussion Shell, to be fired horizontally from a common Gun. By Lieutenant Colonel Miller, *late of the Rifle Brigade, and now unattached. Communicated by* R. I. Murchison, *Esq. F.R.S.* Read November 16 and 23, 1826. [*Phil. Trans.* 1827, *p.* 1.]

In this paper, the author first considers the theory of rifles, with which the subject of it is intimately connected; and regarding it as an admitted principle, that irregularities in the flight of shot arise from irregularities either in their surface or substance, shows how the rotatory motion of a rifle ball, by presenting every part uniformly to the action of the resisting medium, obviates the effect of these irregularities. The spiral or rotatory motion of the ball in rifles, is generally supposed to arise wholly from the re-action of the grooves in the barrel, or from the indentations made by them in the surface of the ball; but the author, taking into consideration the powerful action of the air on projectiles, is led to conclude that the rotation